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ABSTRACT

Instruction in reading, writing, and thinking has an important place in all classrooms. A study examined the effect of writing instruction on students' mathematics achievement, as measured by grade point average in math class and scores on the New York State Regency Competency Test in Mathematics. Subjects, 56 ninth-grade students involved in a college bound reading program in a New York City high school, received instruction in word processing, writing process, and publishing which focused on the major assignment--writing a guidebook to the state examination for other students in the school. A control group received no writing enrichment. Results showed that the writing instruction had a positive influence on students' math achievement. (Examples are included of similar projects that have been successfully carried out in English and history class.) (ARH)

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Thinking, Reading, and Writing Across the Curriculum

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Much has been said for years about every teacher's essentially being a reading or writing teacher. Content area teachers blanched at the thought of not getting through their syllabi in time for statewide examinations and having their students perform poorly. In the name of time, thinking, close reading, and writing to learn had been abandoned in favor of covering "topics."

Harold Herber has been an advocate of the transformation of learning for decades. The theory, simply stated, is that a skill or piece of information learned in one subject, once mastered, carries into others. Therefore, the outlining skills that a student acquires in English class to organize an essay or paper can be used equally well in social studies or in science where sequential ideas and internal organization are necessary. Likewise, the mathematics teacher, always in a frenzy to keep up with a curriculum, can give writing assignments in order to ascertain whether or not a student has learned the concepts behind certain mathematical principles.

It was just such a notion by which I became involved in a project with ninth graders during the 1986-87 school year. It started the previous year when the Assistant Principal of Guidance told me that the worst statistic in the school was students' passing the New York State Regents Competency Test in

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Mathematics. I told her that 98% of the students in my reading classes at the high school where I taught formerly passed the RCT's in Math after having been in my reading laboratory. This was so because I taught them how to take a test and how to read word problems. I thought I could do the same thing again, running a project and a control group, tracking grades, and ultimately compiling statistics on the state examination.

At the end of the 1985-86 school year, I was approached by the Principal, who asked me to teach the class in a computer laboratory because of a lack of space in the school. As a favor to him, I agreed. Then I wondered what I would do with two classes of freshmen in a computer laboratory; the idea came to me in a flash: the youngsters would write a guidebook to the examination for other students in the school. I had stumbled onto the now-popular theory that writing to learn is very valid pedagogy. Combined with the motivational elements of having youngsters learn word processing, writing process, and finally publishing, I found I had a winning combination.

The following chart gives the statistics for the youngsters involved in the project. All figures except the results of the RCT Mathematics are for the term ending January, 1987.

January, 1987

# students	# pass math	# fail math	% passing math	mean total average	6/87 % pass RCTM
control 29	7	22	24.1%	62.7%	30%
project 31	16	14 +1 late entrant	51.6%	69.2%	60%
differences for project	+9	-8	+27.5%	+6.5%	+30%

Perhaps more telling are the following statistics for June, 1987:

June, 1987

# students	# pass math	# fail math	% passing math	mean total average	mean math average
control 27	15	12	55%	68.4%	62.2%
project 25	13	12	52%	64%	66.7%
differences for project	- 2	0	-3%	-4.4%	+4.5%

Although the statistics are not significant, there seemed to be a huge slippage of the percentage of students in the project group who had passed mathematics the first term as compared to the spring term. Not one student in the project group had an overall academic average above 77%. Four students in the control

group did. Additionally, there were a greater number of truants and no-shows in the project group, a total of thirteen, as compared to the control group, which had seven. Interestingly enough, scrutiny of final report cards showed that even those students who were identified as having a chronic attendance problem, absented themselves from the College Bound Reading Laboratory, in which the project took place, many fewer times than from traditional classes. (Note: The College Bound Program identifies youngsters who are weak in basic skills and provides extra help in the form of mathematics and reading laboratories to bring them up to a level suitable for entrance to colleges.) I would venture to guess that the motivational value of the computers as well as the sense of accomplishment in completing a challenging task had its effect on the most difficult population in the school. The passing percentages on the RCT Math was even more impressive in light of the fact that the project group appeared weaker at the end of the year.

Furthermore, I saw how writing about mathematics had made an impact upon the math averages of even students who were marginal or below average academically. Throughout the term I hypothesized that writing to learn was having a positive effect on my students. They had to explain how to take tests, how to take an orderly approach to problem solving, and how to make up problems to illustrate mathematical rules. I also engaged my classes in other interdisciplinary activities. I believed that the higher-order thinking skill of synthesis was requisite to

making some sense of all the component parts of the examination that the students were learning.

As the teacher of a College Bound Reading Laboratory, I had the latitude to enrich and supplement the content-area teachers' purview. In February my classes did research in the school library requiring three different references for Black History Month. The students shared their information with youngsters in an English class. They young people who presented their reports acted as teacher, asked questions of the audience who took notes, and evaluated what the other students had gotten from each report. The lesson was videotaped and later evaluated by the students themselves.

For Women's History Month in March, I arranged a visit to the Lehman College library. There, my students worked in panels of three to research the history, important legislation, and current status pertaining to women's issues. On this occasion students made charts and graphs illustrating the major points they wanted to make. They spoke without notes this time, a major improvement over their first effort, each elaborating on what they had discovered. The information was presented in two history classes of eleventh graders. Youngsters interacted in a question and answer period during which the panel members defended their positions with information they had gleaned. In other words, they validated their opinions. Once more the classes were videotaped. Students saw themselves as others saw them. Again, self-evaluation followed.

Several students presesnted the work they had done up to this point in the year to a group of Assistant Principals of English from the Bronx. They testified that an integrated approach to education was indeed having an impact on all of their classes.

A bonus was the fact that the youngsters were cognizant of the poise, self-esteems, and sense of accomplishment they had gained as a result of undertaking some very sophisticated challenges. They glowed as they saw their year-long labors become tangible in a seventy-page book presented to each of them at a publication party in June, 1987. The ceremony was attended by representatives of the Board of Education, the press, the Mayor's office, and business agencies. This too was videotaped for WNYE television. Students, teachers, and parents were interviewed.

The project's outcome was shared with the Superintendent, the Principal, and the Assistant Principals of Guidance and Mathematics. In addition to writing about mathematics in an English class, the students also kept learning logs in which they evaluated and monitored what they did on a daily basis. They youngsters saw how connections with what they did from class to class applied not only by calling up files from diskette on a daily basis, but also building on the previous day's concepts in basic skills and problem solving. Finally, and perhaps most importantly, they became aware that school has a connection to life. As the lyric of an old song goes, "Who could ask for

anything more?"